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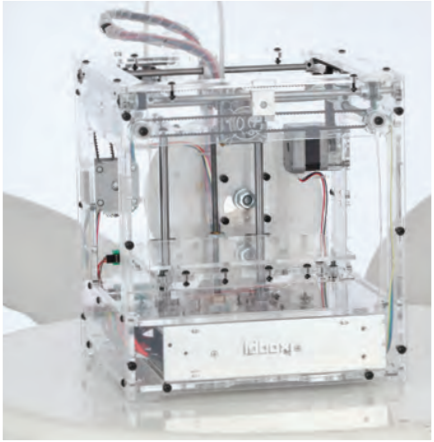

CONTENTS

Assembly Guide

The next five detailed and easy-to-follow stages of construction for your 3D printer.

WARNING: Not suitable for children under the age of 14. This product is not a toy and is not designed or intended for use in play. Items may vary from those shown.

DeAGOSTINI MODEL SPACE™

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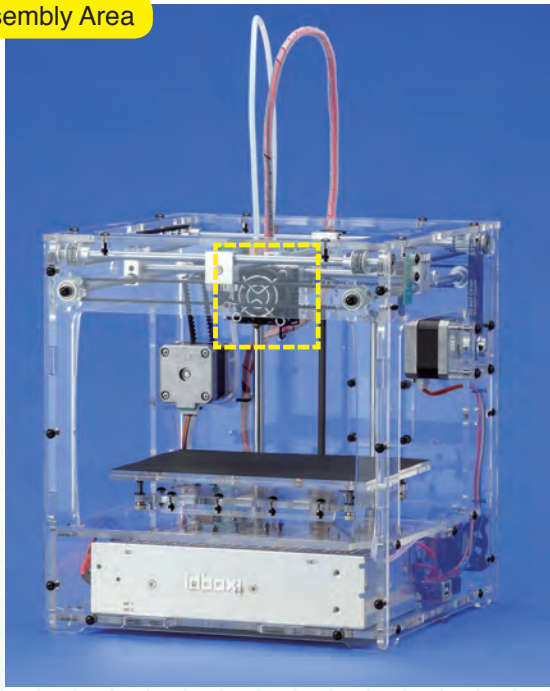
Stage 36 Assembly Area



Stage 36: Attach the head assembly to the head rods

In this stage, you assemble the head (last worked on in Stage 31) into the housing. You do this by sliding the two head rods through holes in the head.

Before you can slide each head rod through its corresponding hole in the head, you need to remove one end of the head rod from its slider so it can be pushed into the head. Turn the head so the fan is facing the front. When the head rods have been put through the holes in the head, and the head rods are put back in the sliders, tighten the set screws that grip the rods. Make sure that the head rods do not protrude from the sliders when they are tightened.

Stage 36 Components

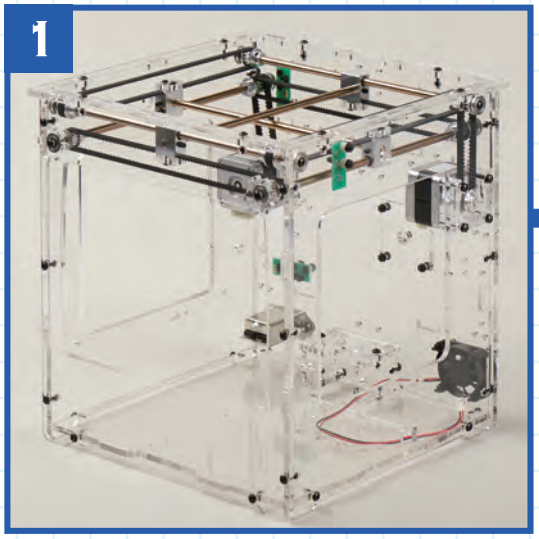
1: Top panel x 1
2: M3 washers x 8
3: Cable ties x 2

Tools you will need

Allen key (2mm) supplied with Stage 11

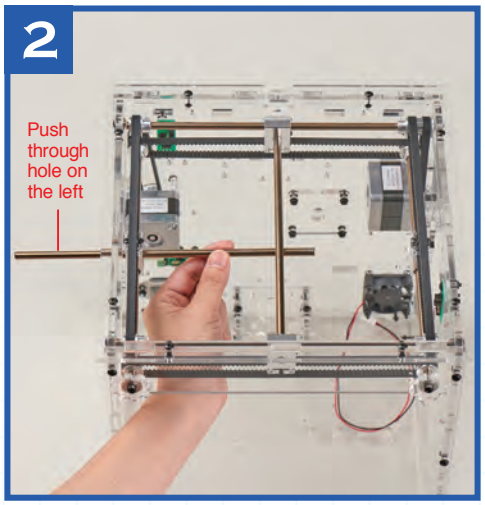
Parts to have ready

1

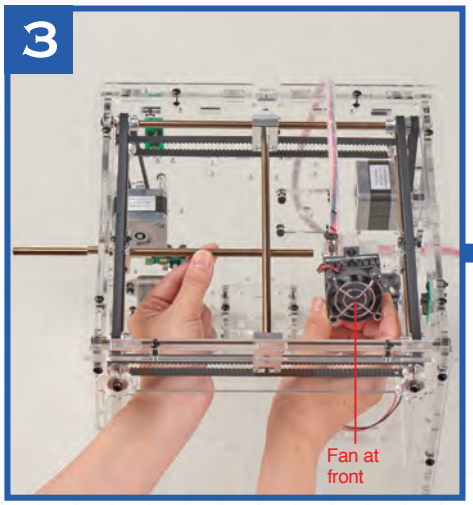


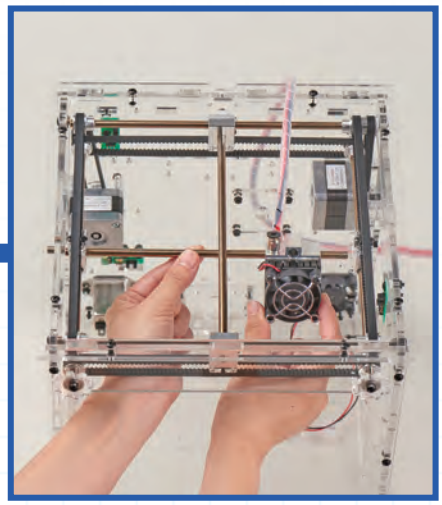
You will need the printer body and the head block assembly that you last worked on in Stage 31.

Pass the head rods through the head

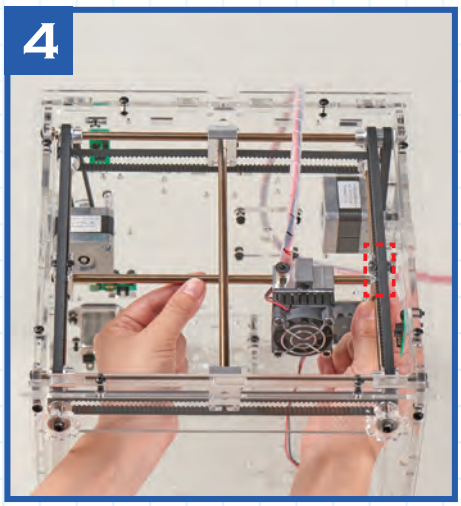


With the front of the printer facing you, move the Y-axis head rod so that it aligns with the hole halfway across the left panel of the housing, then push the rod out through the hole, to just under halfway.

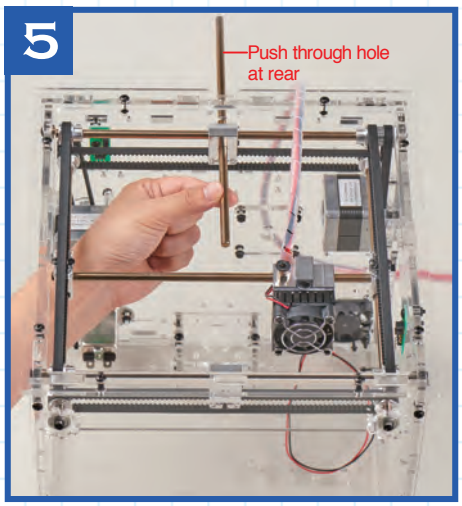




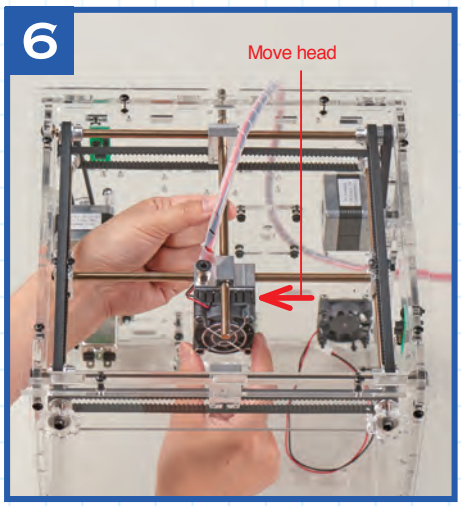
With the cooling fan on the head block facing the front, as shown, slide the Y-axis head rod into the head rod hole in the head block. The nozzle should be pointing down.



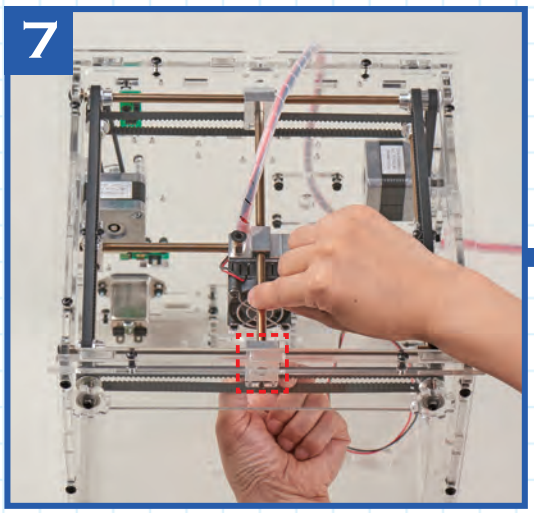
Push the head rod back into the slider on the right (outlined in red, above).

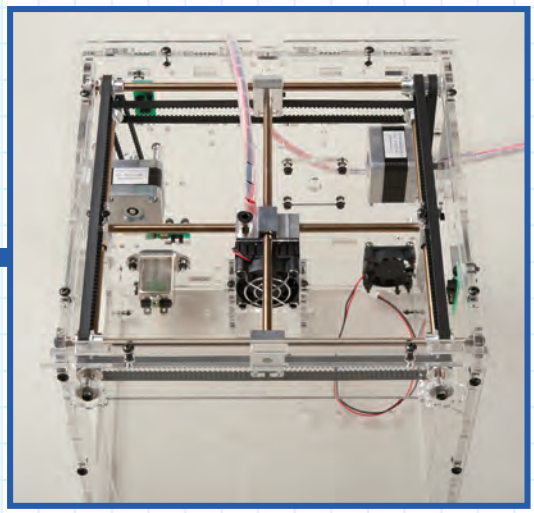


Push the X-axis head rod through the slider and out of the hole in the rear of the housing.



Move the head block to the centre and push the X-axis head rod through the head rod hole in the top of the head block.

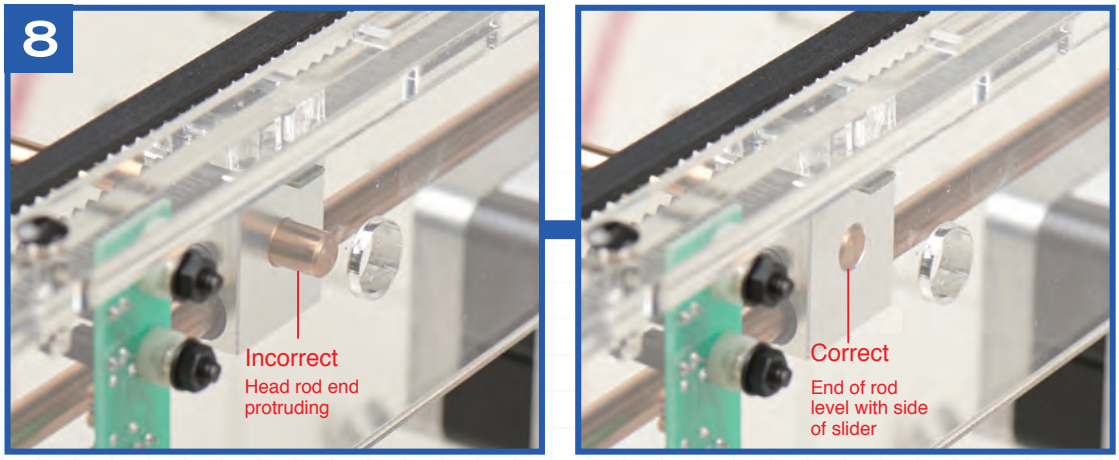




Push the end of the X-axis head rod back into the hole in the slider (outlined in red, above left).

Tighten the set screws in the sliders to fix the head rods

8

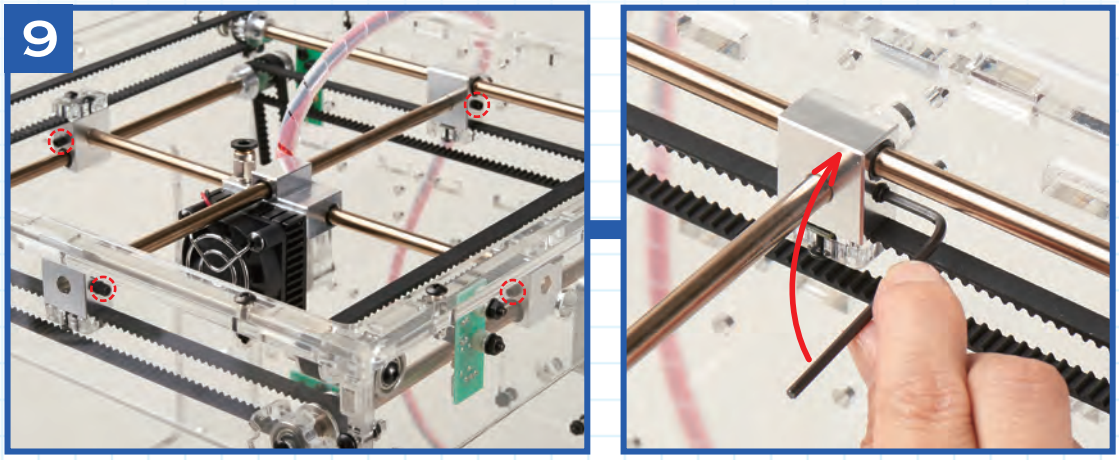


POINT

Check that the ends of the head rods do not touch the limit switches on the X and Y axes.

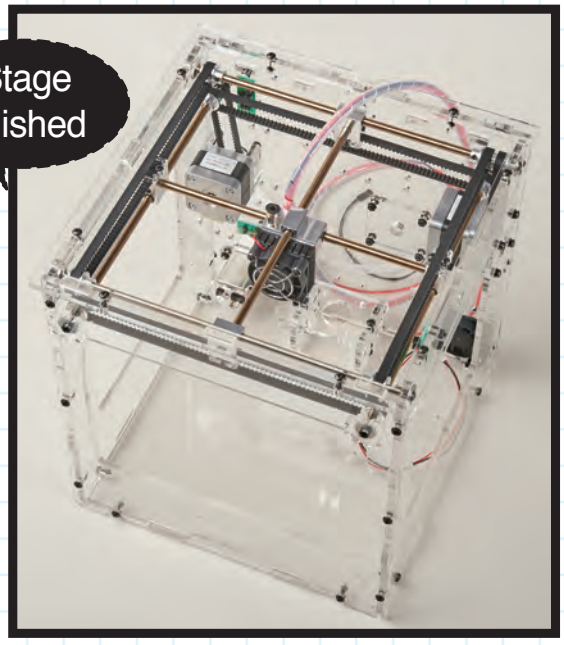
Make sure that the ends of the head rods do not protrude from the sliders. The ends should be level with the sides of the sliders, as shown above.

9



Use the 2mm Allen key to tighten (clockwise) all four of the set screws (ringed in red, above) in the sliders.

Stage finished

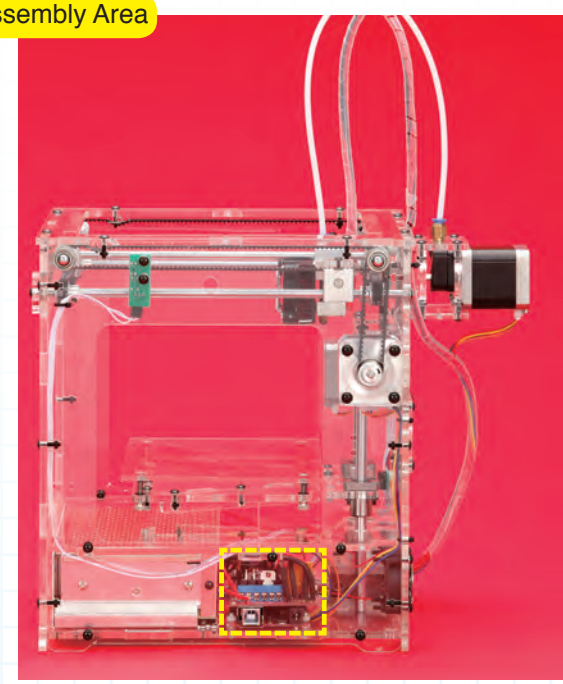


The printer head is now assembled into the housing.

Store the parts

Store the parts supplied with this stage safely, as they will be used later.

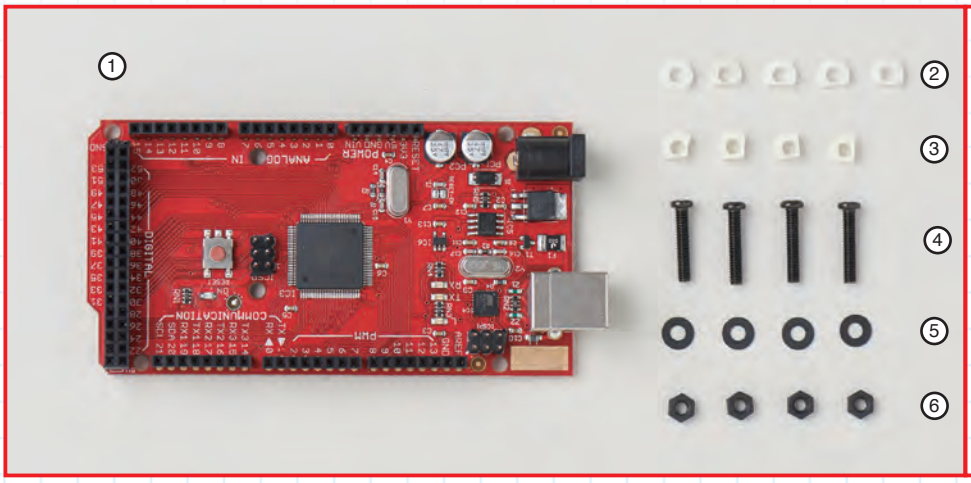
Stage 37 Assembly Area



Stage 37: Add the circuit board to the housing

In this stage, the circuit board is attached to the bottom panel of the housing. The board is a precision component, so handle it carefully and keep it away from humidity and dust.

Five 2mm-thick spacers are provided, with a flat, cut-out section along one side. These fit over holes in the bottom of the housing. The orientation of the spacers is important and the cut-outs on two of the spacers must align in such a way that they do not touch the components of the circuit board. There are also four 3mm-thick spacers. Four screws are then inserted, which go through the 3mm spacers, the circuit board, the 2mm spacers and the housing. Then the housing is turned over, and the circuit board is secured with washers and nuts.



Stage 37 Components

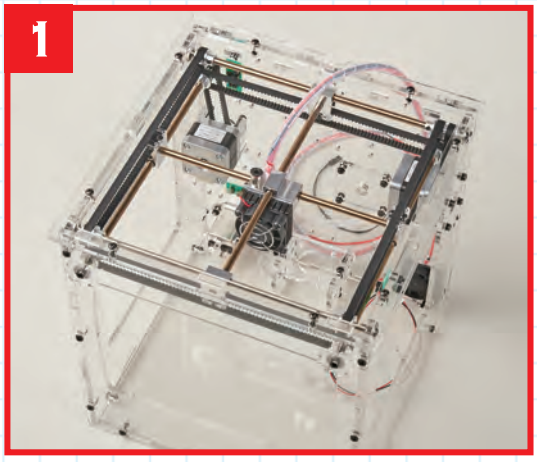
1: Circuit board x 1
2: M3 spacers (2mm thick) x 5
3: M3 spacers (3mm thick) x 4
4: M3 screws (16mm) x 4
5: M3 washers x 4
6: M3 nuts x 4

Tools you will need

Phillips screwdriver size 2
Spanner supplied with Stage 9

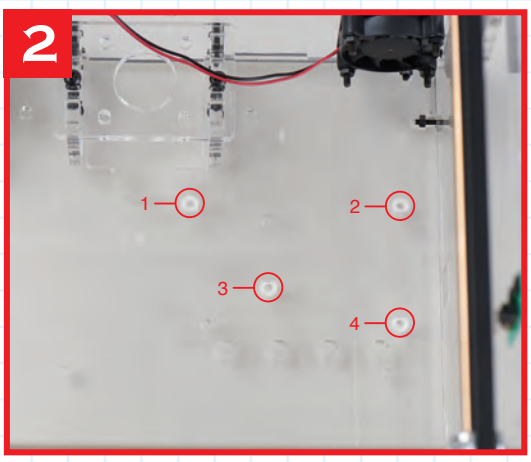
Position the 2mm spacers on the bottom of the housing

1



Turn the housing so the front is facing you. Move the head to the front left for ease of access to the bottom of the housing.

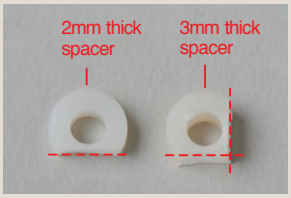
2



Put a 2mm spacer over each of the holes numbered 1 to 4 in the positions shown (ringed in red, above) on the bottom of the housing. Put the spacers in positions 2 and 4 as shown so their cut-outs clear any components on the circuit board. Spacers in positions 1 and 3 can be in any orientation.

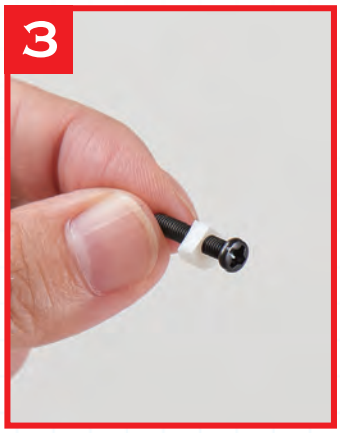
HINT

There are two types of spacer supplied. The 2mm-thick ones have a cut-out on one side. The 3mm-thick ones have cut-outs on two sides.



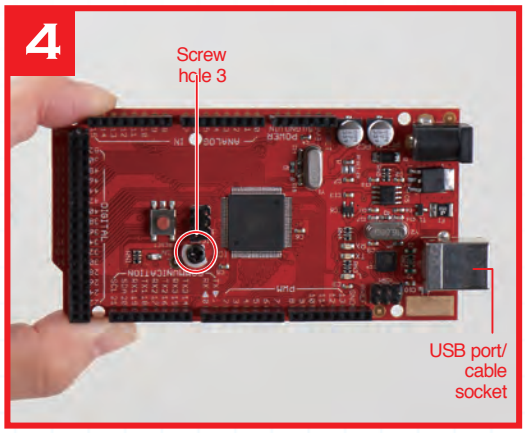
Secure the circuit board to the housing

3



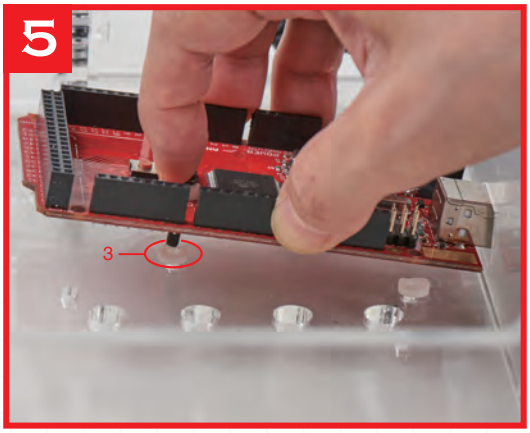
Put a 3mm-thick spacer on each of the four M3 16mm screws supplied.

4



Insert a screw (with 3mm spacer) into screw hole 3, so the cut-outs on the spacer clear any components on the board. Hold the board as shown (above right) and put the USB port through the hole in the housing. Then insert the screw through the 2mm spacer resting on the housing, and through screw hole 3 in the housing.

5



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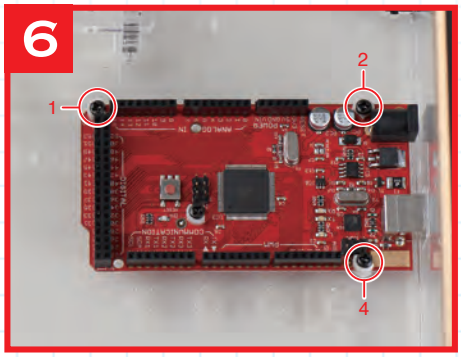
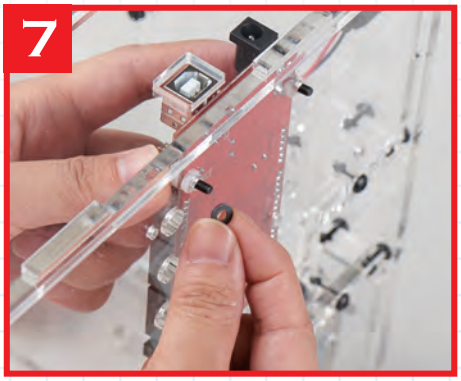


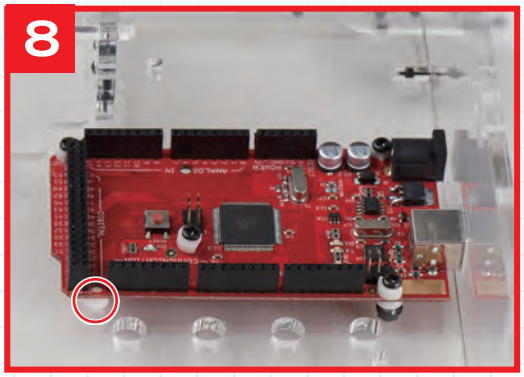
Put the other three screws with spacers through holes 1, 2 and 4 (shown ringed in red, above). Check that the spacers are orientated so their cut-outs avoid any components or soldered areas on the top and bottom of the board.

7



Hold onto the screw heads and the board with one hand to stop the screws coming out while you turn the housing so the right side is uppermost. Put M3 washers and nuts on each of the four screws and finger tighten the nuts.

8



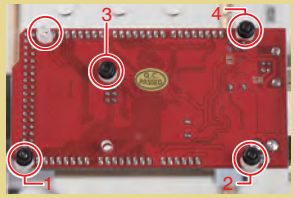
Turn the housing so that the bottom is facing down and put the last 2mm-thick spacer between the board and the bottom of the housing in the position shown (ringed in red, above). Make sure the spacer is oriented so its cut-out clears any components or soldered areas.

9

Turn the housing on its side again and tighten the screws fully, using a Phillips screwdriver and the acrylic spanner supplied with Stage 9. Finally, turn the housing right way up and check that the board is not loose.

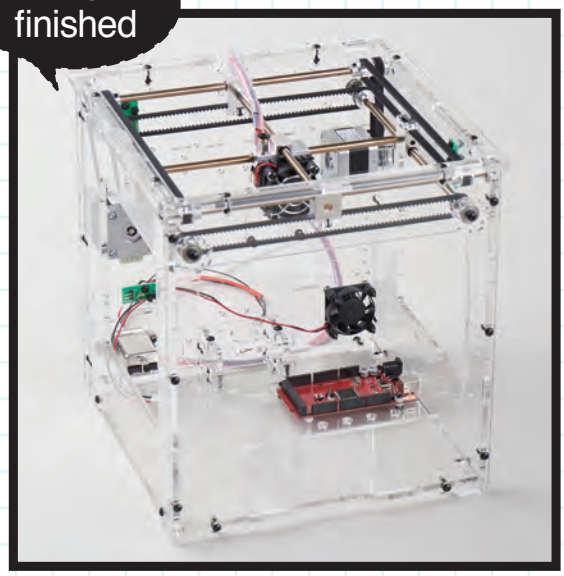
POINT

Make sure that none of the 2mm-thick spacers (ringed in red, below) under the board are touching any soldered areas.



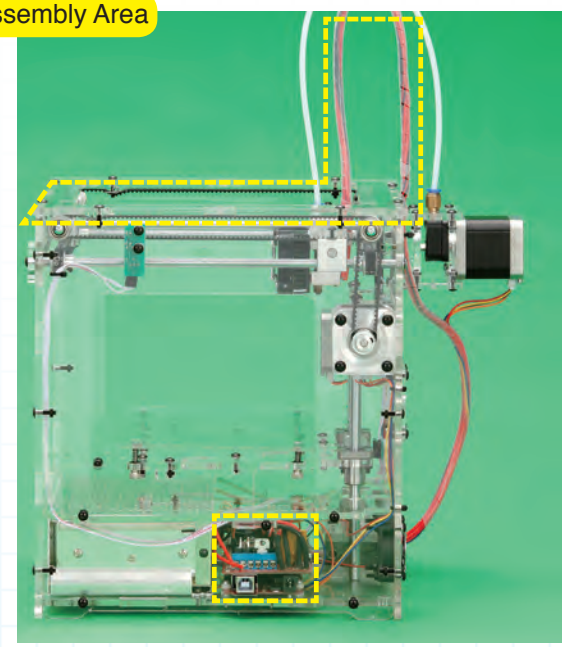
The circuit board has been added to the printer housing. Store the assembly carefully and cover it to keep it free of dust.

Stage finished



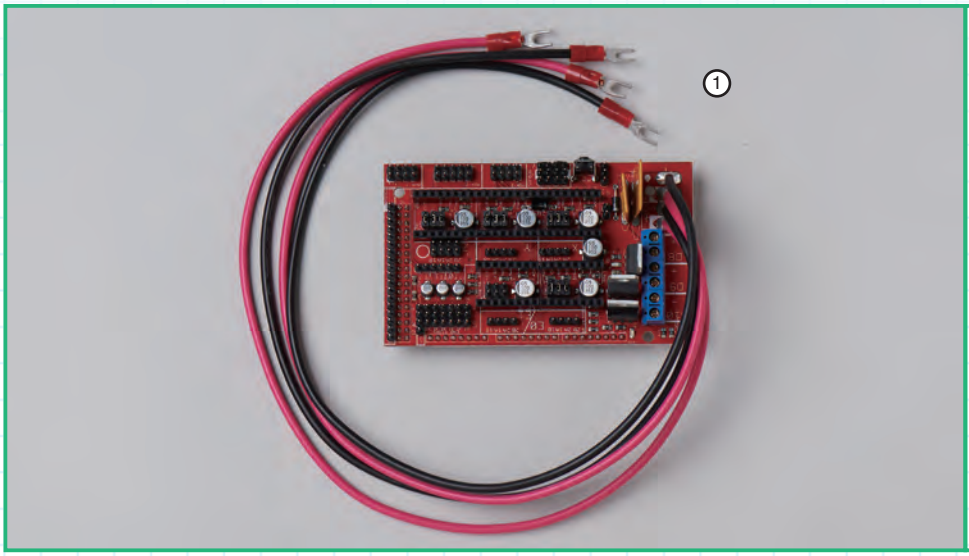
Stage 38: Plug the driver board into the circuit board

Stage 38 Assembly Area



In this stage, you will remove the assembly jig and replace it with the top panel. You will also secure the head block's cables to the rear of the housing. Then you connect the cables from the cartridge heater to the driver board and then plug the driver board into the circuit board.

Here the assembly jig is removed, but do not throw it away, as it might be needed later. You then connect the wires from the cartridge heater to the driver board, being careful to ensure that the wires are put into the correct terminals. Next comes the job of plugging the driver board into the circuit board. If you make sure that the two boards are parallel to each other during this operation, the pins should go in easily without bending.



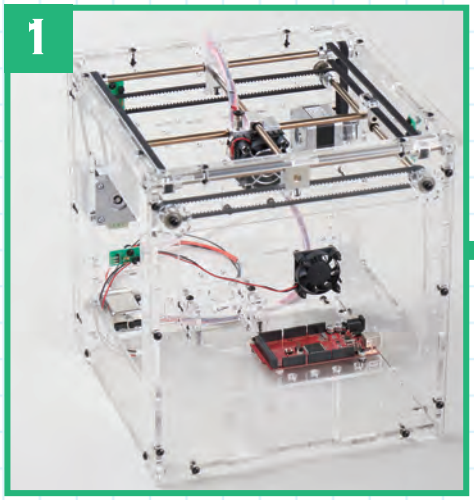
Stage 38 Components

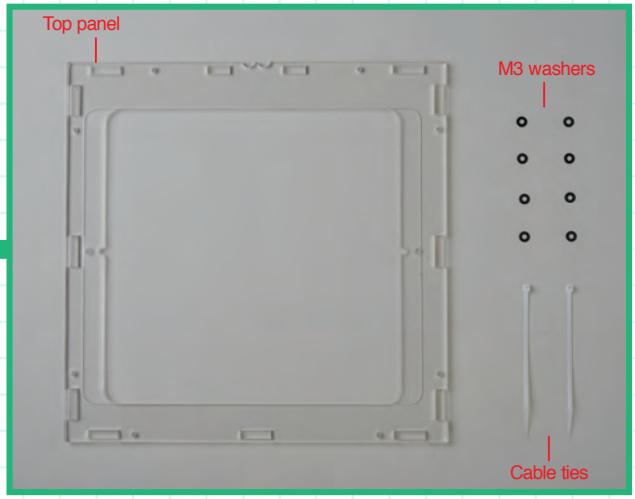
1: Driver board x 1

Tools you will need

Phillips screwdriver size 1
Ruler
Marker pen
Scissors

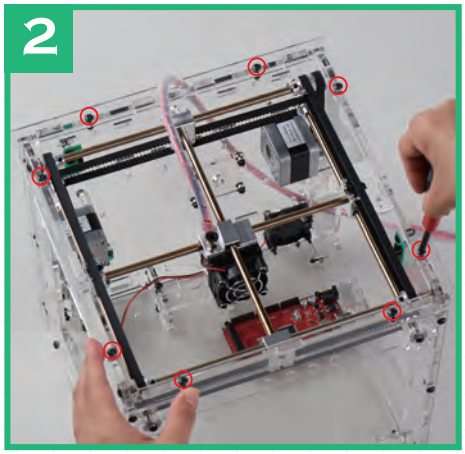
Parts to have ready



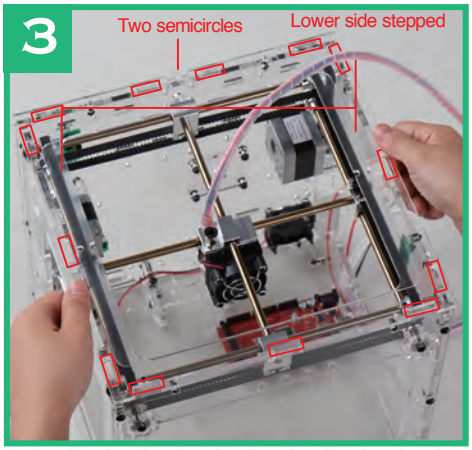


Turn the printer housing so the front panel is facing you. You will need the top panel, plus the eight M3 washers and the two cable ties supplied with Stage 36.

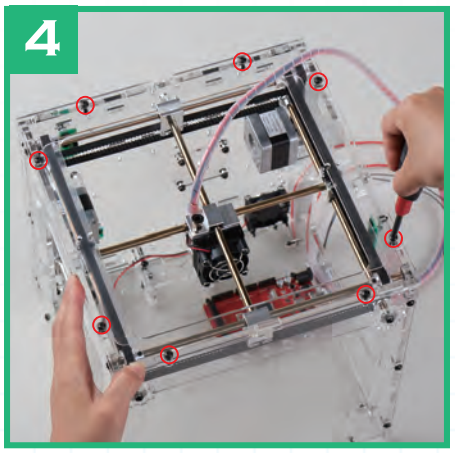
Attach the top panel



Unscrew and remove all eight of the screws (shown ringed in red, above) and remove the assembly jig. Keep the jig as it might be needed later. Put an M3 washer on each of the eight screws you have just removed.

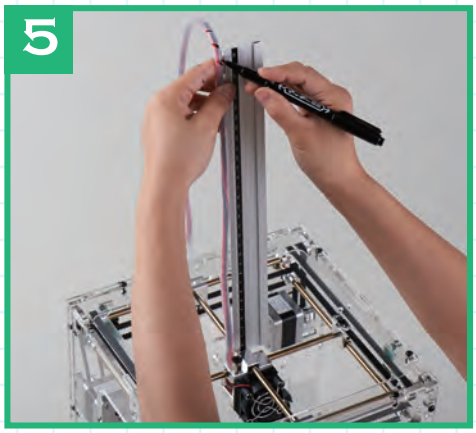


Hold the top panel as shown so the two semicircular cut-outs are at the rear and the stepped surface is facing downwards. Align the slots in the top with the tabs (shown outlined in red, above) and push the tabs through the slots firmly.

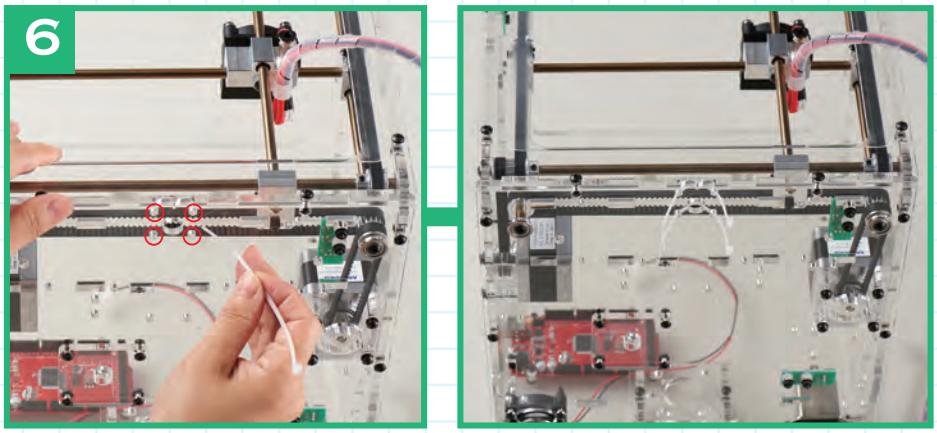


Insert the screws into their nuts and, moving from one nut to the other diagonally opposite, tighten them gradually until the panel is firmly attached to the housing.

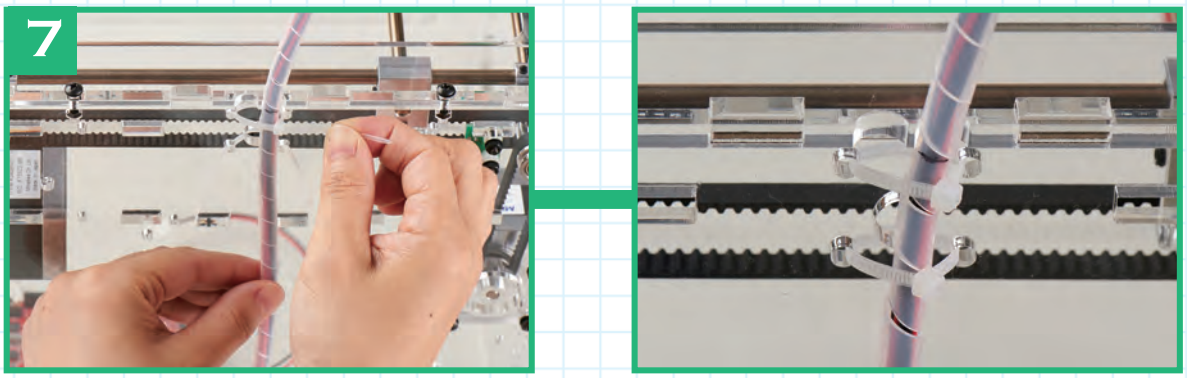
Secure the spiral tube to the rear of the housing



Measure about 30cm from the head block along the spiral tube and mark the tube with the marker pen.

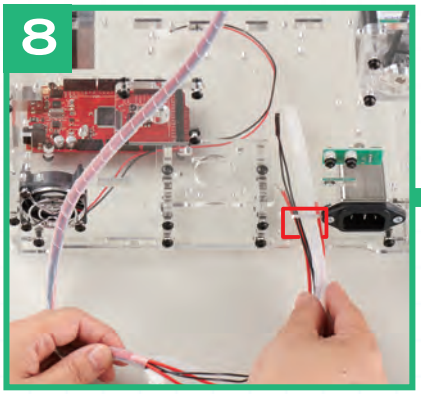


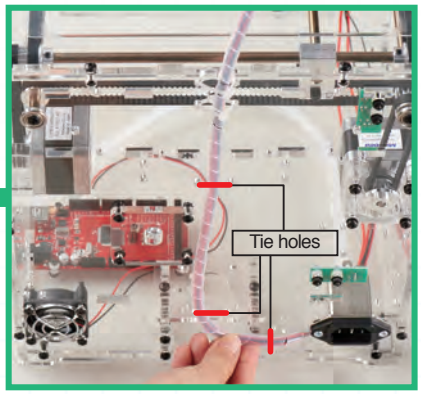
Turn the printer so the rear is facing you and insert the cable ties into the holes (ringed in red) as shown above, so one tie is above the other.



Look for the mark you made on the spiral tube and align this with the semicircular cut-outs on the rear of the top panel. Use the cable ties to hold the spiral tube to the housing. The ties should have their jagged or toothed sides on the inside. When you've tightened the ties, cut off any excess with the scissors.

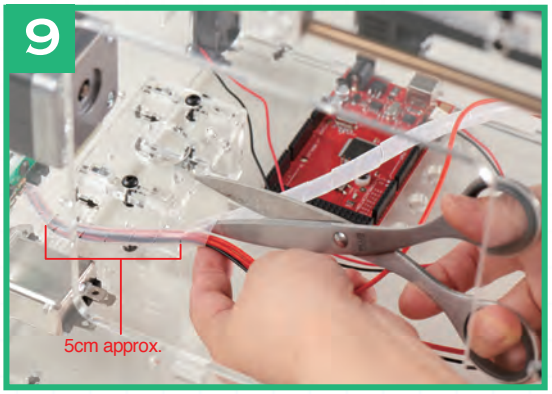
8





Insert the cables and spiral tube into the housing through the hole (outlined in red, above left) next to the noise filter. In a later stage, the spiral tube will be secured on the outside of the housing with cable ties that go through the holes marked out by the thick red lines shown above right.

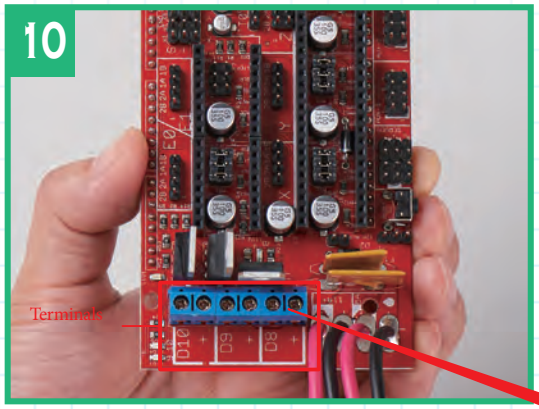
9

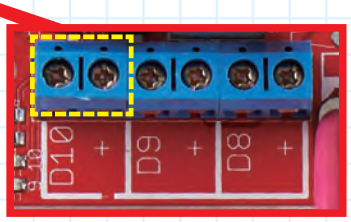


Unwind the spiral tube from the cables on the inside of the housing to a point about 5cm in from where the cables enter the housing. Cut off the excess spiral tube with scissors.

Connect the cartridge heater to the driver board

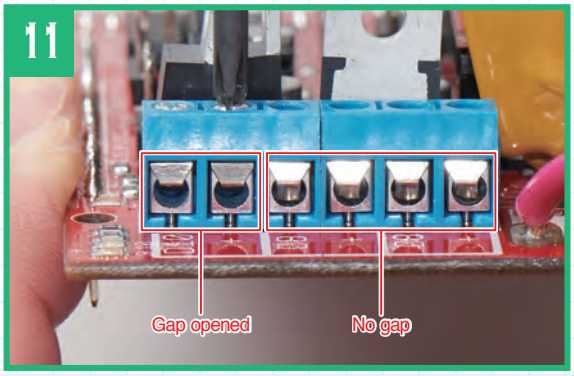
10





The terminals or connectors on the driver board (outlined in red above) have letter and number codes that tell you what they are for. The terminals outlined in yellow (right) and labelled D10 are for the cables from the cartridge heater.

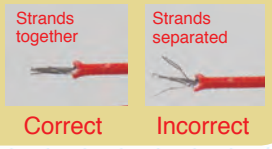
11



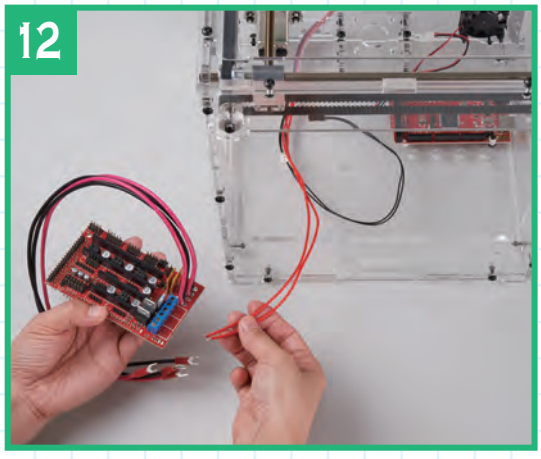
Unscrew the two screws in the D10 terminals so there are gaps into which the cartridge heater wires can be inserted. If the screwdriver is too wide, use a size 0 instead of a size 1. Make sure the gaps are wide enough so the wires can go in and be gripped by the screw.

POINT

Ensure the strands of the wires are gathered together before you insert them into the terminals.

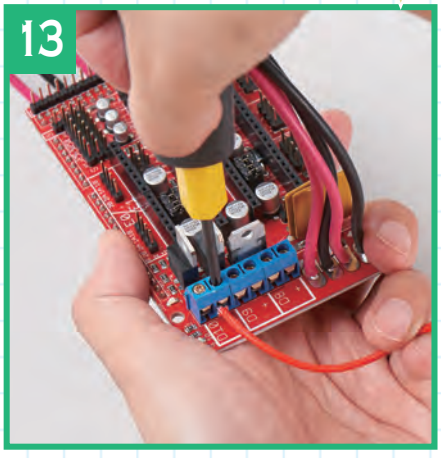


12



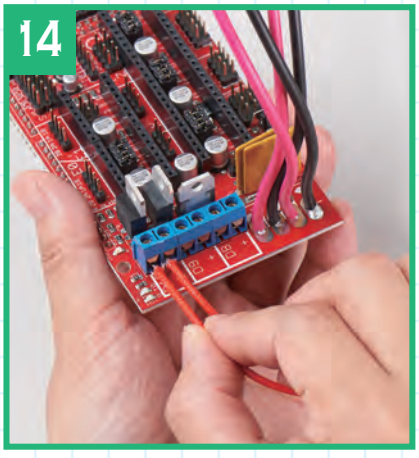
Turn the housing so that the front panel is facing you. Pull the two wires from the cartridge heater out of the housing through the hole in the panel. Push the wire of one of the cables into one of the terminals so that it goes all the way in.

13



Tighten the screw in the terminal firmly, holding the wire in position while you do so if necessary. After tightening, give the wire a gentle pull to check that it is not loose.

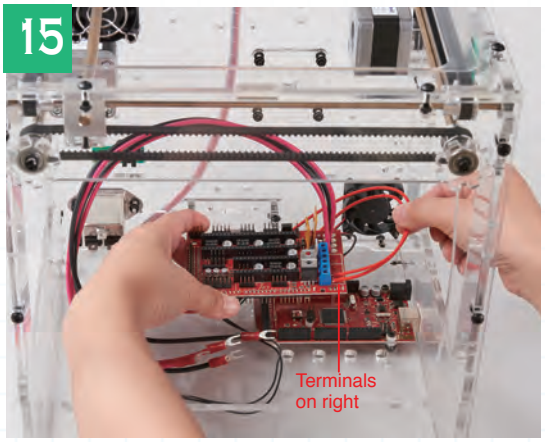
14



Repeat the process for the other cartridge heater wire.

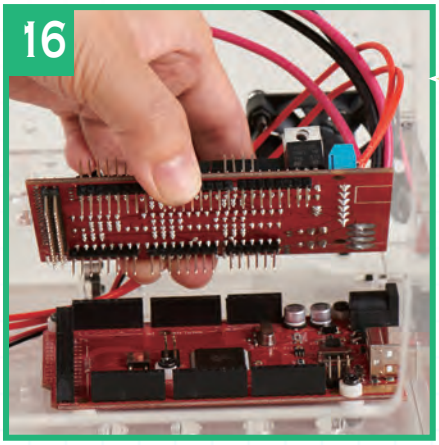
Plug the driver board into the circuit board

15



With the terminals on the right, move the driver board into the housing. Guide in the wires from the cartridge heater so they do not get caught.

16

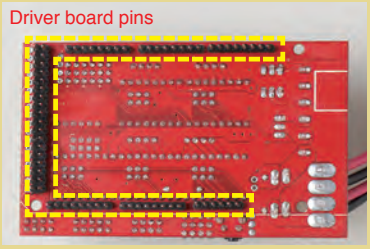


Align the driver board so the pins on its underside are above the matching sockets on the circuit board.

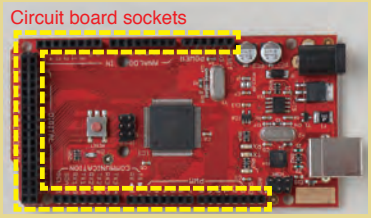
POINT

The pins on the underneath of the driver board are arranged in a 'U' shape, as are the matching sockets on the circuit board. When you first bring the boards together, insert them just a little. If it is difficult to get them plugged in, check whether any of the pins are bent, and, if so, you can attempt to straighten them carefully with some small pliers.

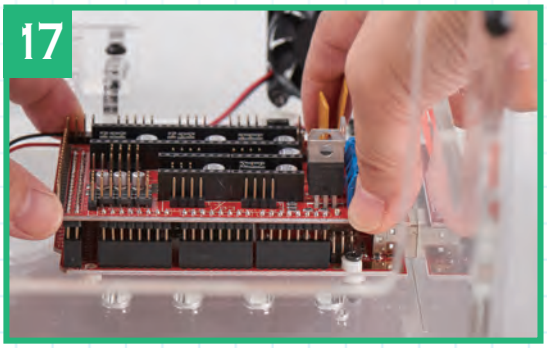
Driver board pins



Circuit board sockets

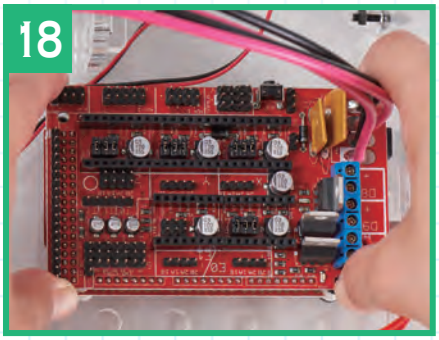


17



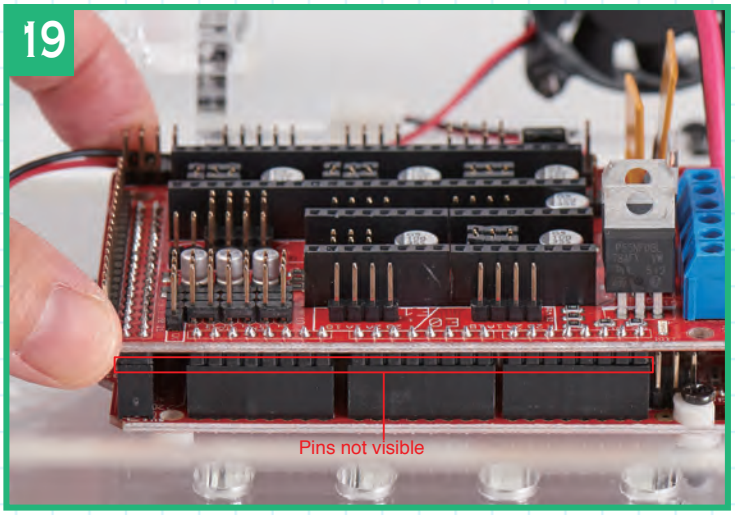
Insert the pins about halfway and check from all sides that they're going in properly. When pressing the driver board down, try not to touch any components or metal surfaces.

18



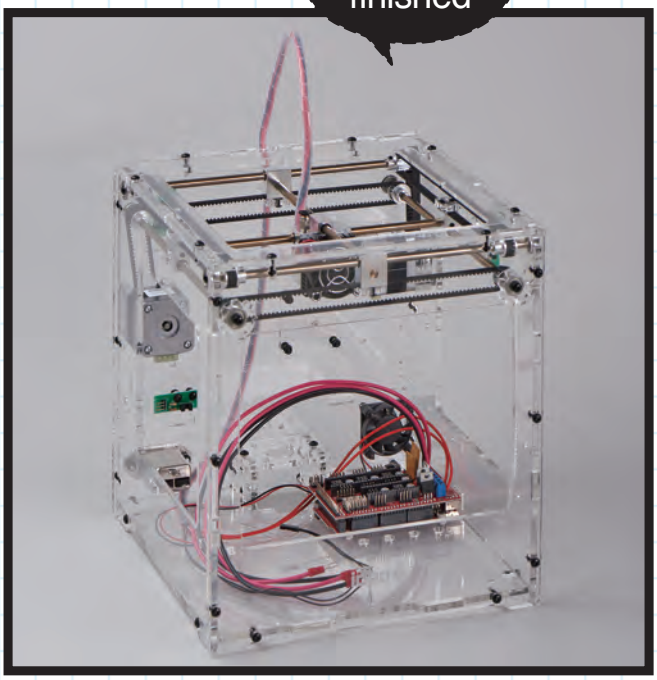
Slowly insert the pins, keeping the driver board parallel to the circuit board.

19



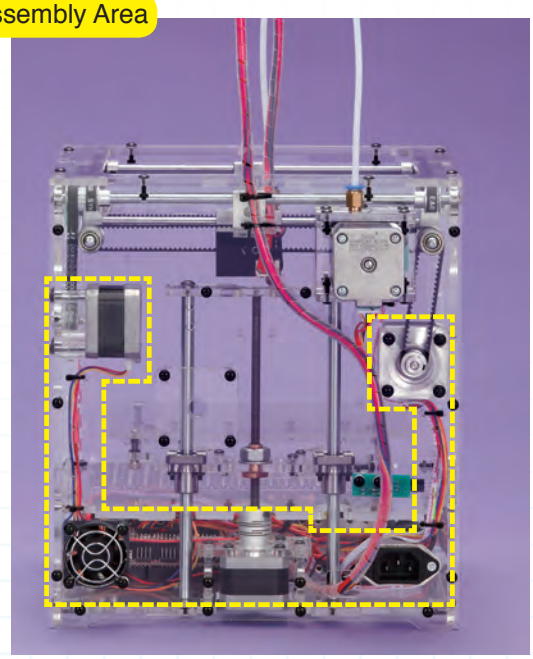
Holding the driver board firmly, push the pins all the way into their sockets. You can check that the pins are all the way by looking from the sides. If they are fully inserted, the pins will not be visible. Check all three sides, not just from the front.

Stage finished



The driver board is now plugged into the circuit board. When you put the printer away, protect it from impacts and dust, perhaps by putting it into a cardboard box.

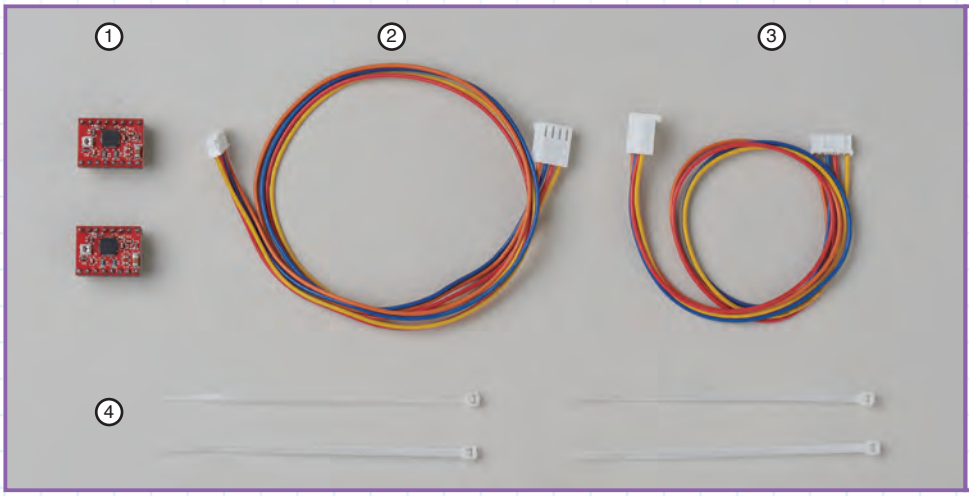
Stage 39 Assembly Area



Stage 39: Attach the motor drivers and cables for the X- and Y-axis motors

In this stage, you plug the motor drivers for the X- and Y-axes into the driver board, then link the motors to the driver board using the motor cables supplied. The components are precision parts, so treat them carefully.

The motor drivers supplied this time are identical to each other. You have to make sure you plug them into the driver board in the correct orientation, that they are on straight and that the pins are all the way in. The cables that connect the motors to the driver board are not the same, however. The X-axis one is longer than the one for the Y-axis. Make sure you plug the driver board end of the cables into the correct positions. You also use cable ties to hold the cables to the housing.



Stage 39 Components

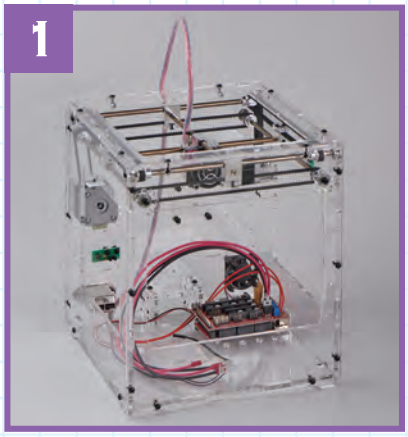
1: Motor drivers x 2
2: X-axis motor cable (420mm) x 1
3: Y-axis motor cable (310mm) x 1
4: Cable ties x 4

Tools you will need

Scissors

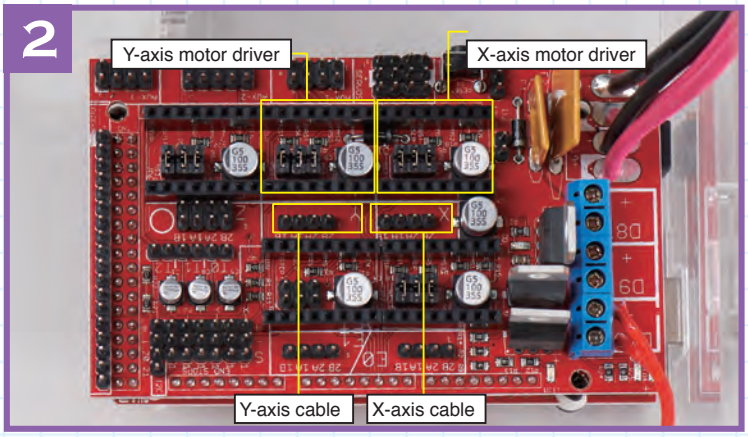
Parts to have ready

1



Get the housing and turn it so the front is facing you.

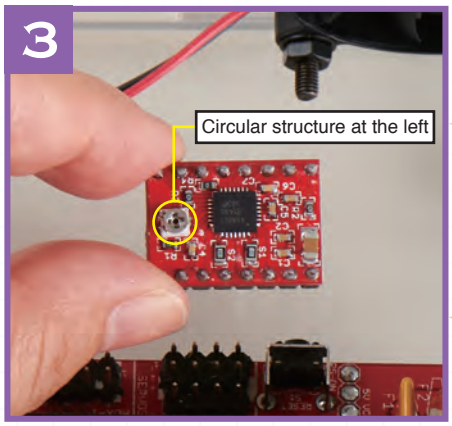
2



In the last stage, you plugged the driver board into the circuit board. Now the motor drivers are plugged into the driver board and the motor cables attached in the positions shown above.

Plug the motor drivers into the driver board

3



CAUTION!

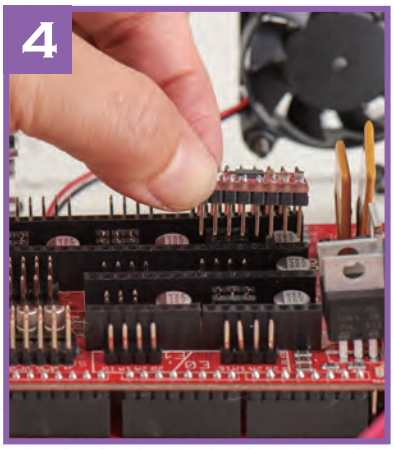
All the drivers have the component that has a circular shape and in all cases – whether for X, Y, Z axes or the feeder – the structure should be on the left when viewed with the front of the housing facing you.

POINT

The circular component is a variable resistor. Do not touch it or try to adjust it, as doing so might damage or cause overheating of the circuitry.

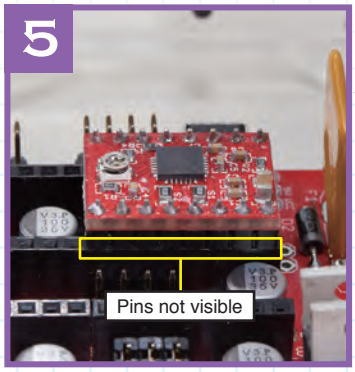
Get ready one of the motor drivers. There is a component with a circular structure on the board. This should be on the left.

4



Plug the pins of the motor driver halfway into the sockets for the X-axis motor on the driver board.

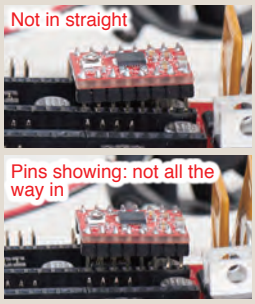
5



Keeping the motor driver board parallel with the driver board, push the pins in all the way. When they are no longer visible the board is fully plugged in.

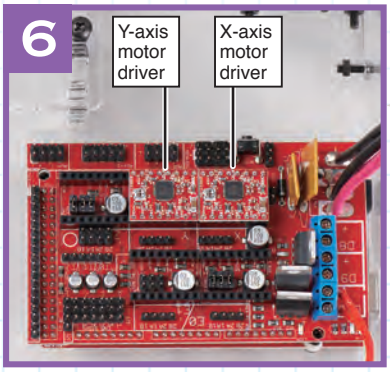
HINT

Make sure the motor driver is not at an angle and that its pins are fully inserted.



Both Incorrect

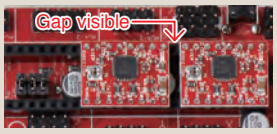
6



Plug the driver for the Y-axis motor into the driver board in the same way you did the X-axis driver.

CAUTION!

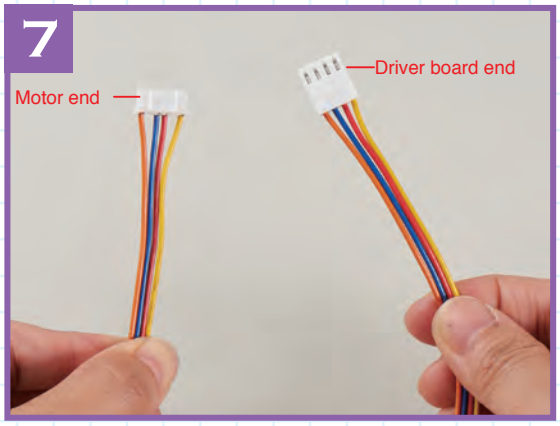
Make sure that there is no gap between the X- and Y-axis motor drivers. If there is, unplug the Y-axis driver and move it to the correct position. Also make sure the circular structures are on the left. If they are not correctly positioned, there is a danger of fire during operation of the printer.



Incorrect

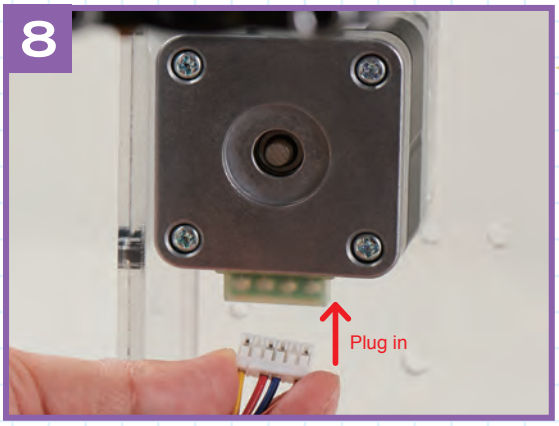
Connect the X- and Y-motor cables to the driver board

7



Get ready the X-axis motor cable, which is the longer of the two supplied this time. The connectors on each end of the cables are different: the smaller ones plug into the motors and the larger into the driver board.

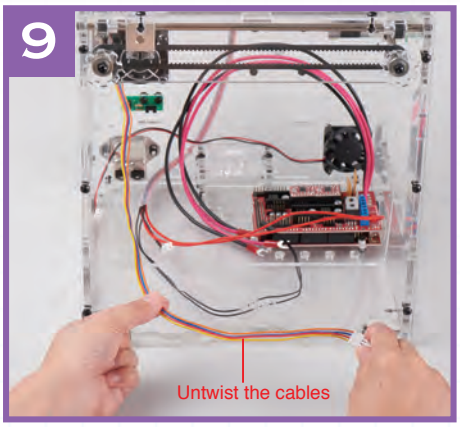
8



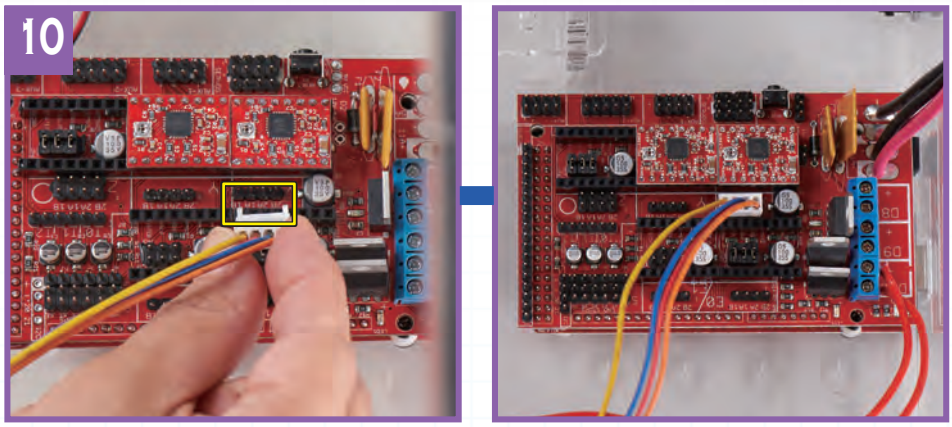
Plug the connector into the socket in the bottom of the X-axis motor (which is mounted on the rear panel of the housing). Hold the connector and not the wires when you plug it in.

POINT

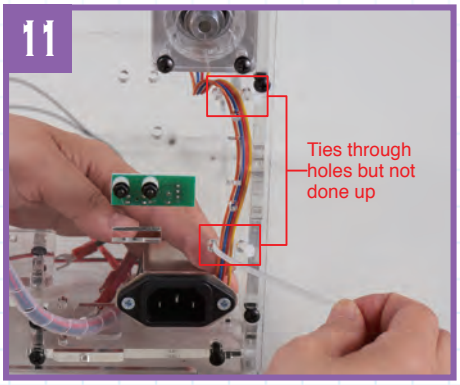
You can only plug the connector in one way. When viewed from the front, the yellow cable should be on the left and the orange on the right.



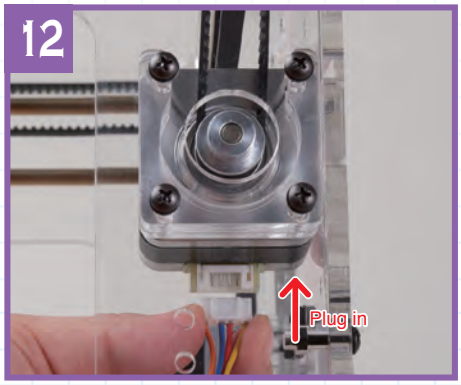
If the cable is twisted untwist it by turning the connector.



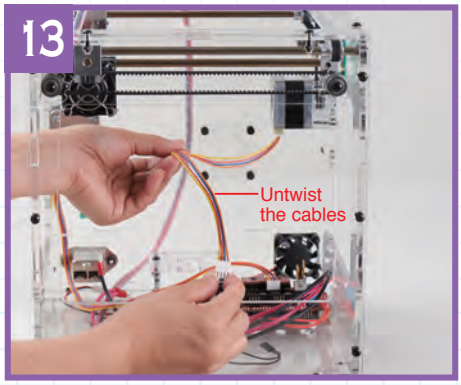
When there are no twists in the cable, plug the pins on the driver board for the X-axis motor (outlined into yellow, above) into the sockets in the connector on the cable's end. Viewed from the front, the yellow wire should be at the left and the orange at the right.



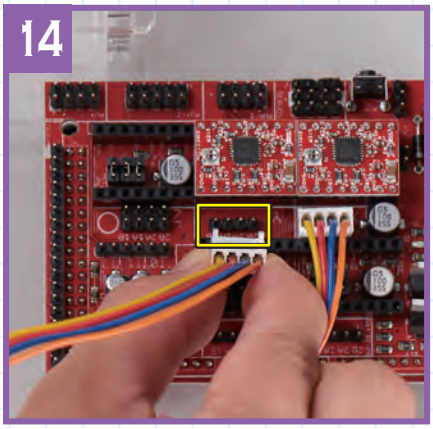
Turn the housing so the rear is facing you. Put two cable ties through the holes in the housing, as shown, so that they loosely holds the cables but do not push the toothed tie sections into their heads as more cables will be added at a later stage.



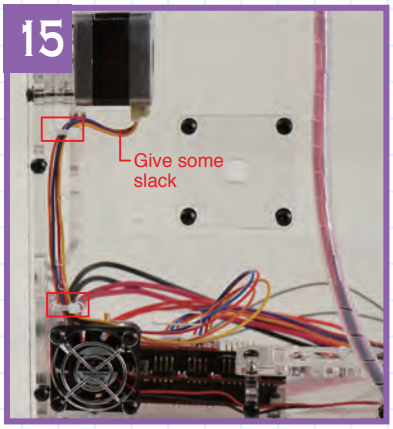
Turn the housing so the right side is facing you. Get ready the Y-axis motor cable and hold the cable's motor end connector as shown so the pins are not visible, and then plug it into the Y-axis motor.



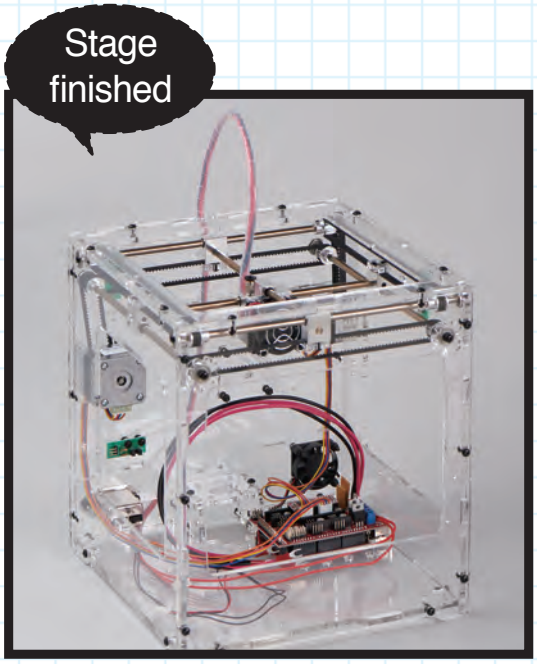
Turn the housing so the front panel is facing you and untwist the cable if necessary by turning the connector at the driver board end.



When the cable is not twisted, plug the pins on the driver board for the Y-axis motor (outlined in yellow, above) into the sockets in the connector on the end of the cable. When viewed from the front, the yellow wire should be on the left and the orange one on the right.

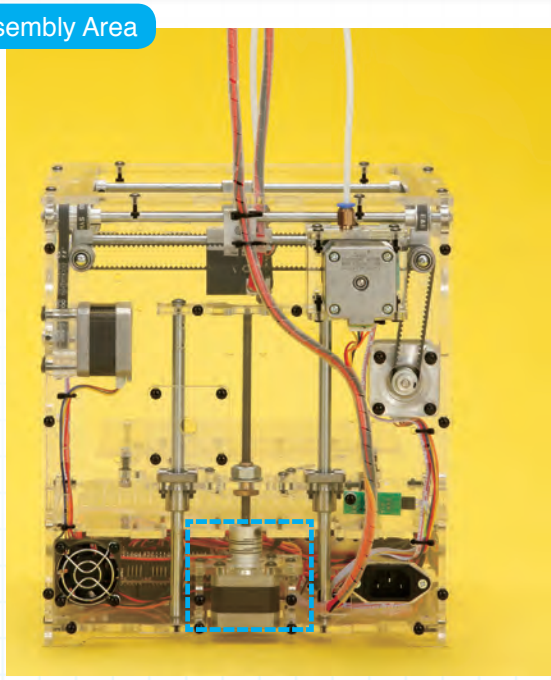


Turn the housing so the rear is facing you. Insert cable ties through the holes shown (outlined in red) and secure the cables by doing up the ties. Give the cable a bit of slack at its motor end. Trim off the excess sections of the cable ties with scissors.



The motor drivers for the X- and Y-axes have been installed and the cables connected to the X- and Y- axis motors have been connected.

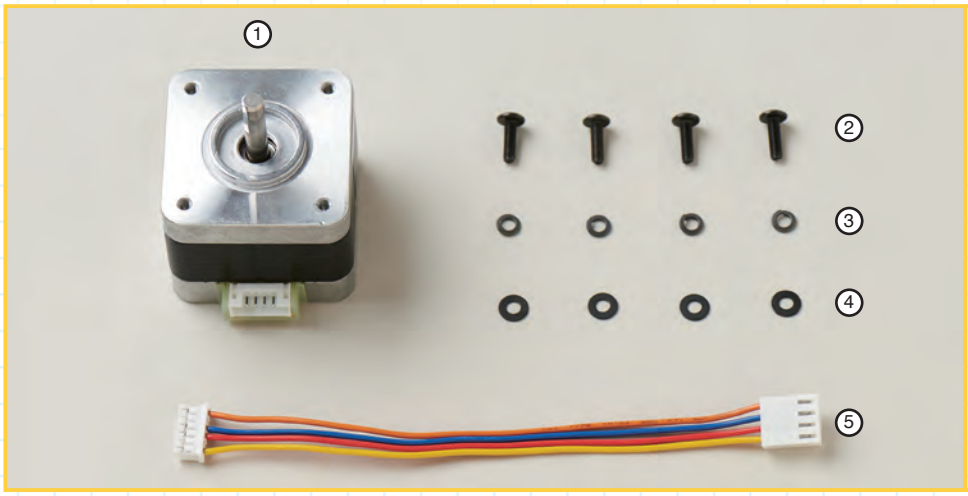
Stage 40 Assembly Area



Stage 40: Temporarily attach the Z-axis motor and add its cable

In this stage, you first plug the connector of the Z-axis motor cable into the plug on the motor, then temporarily attach the motor to its bracket before then plugging the other end of the motor's cable into the driver board.

It's now time to start installing the Z-axis motor, which moves the modelling table up and down. You start by plugging the motor drive cable into the motor before then temporarily attaching the motor to its bracket. The position of the motor will need to be adjusted at a later stage, so the four 10mm M3 screws that hold it in place are only finger tightened this time. Each screw should have a spring washer and flat washer on it. Finally, you plug the Z-axis motor cable into position on the driver board, being careful to ensure it's in the correct place and the right way round.

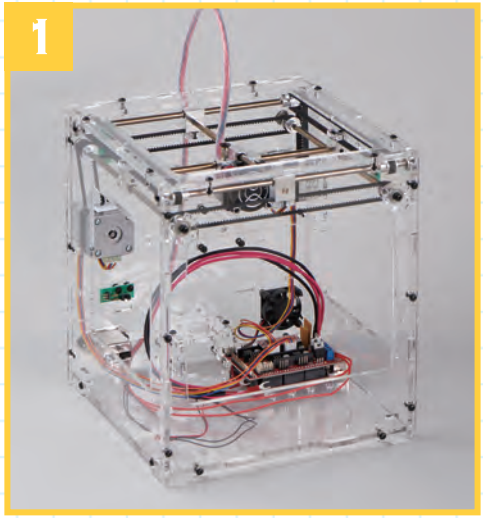


Stage 40 Components

1: Z-axis motor x 1
2: M3 screws (10mm) x 4
3: M3 spring washers x 4
4: M3 (flat) washers x 4
5: Z-axis motor cable (130mm) x 1

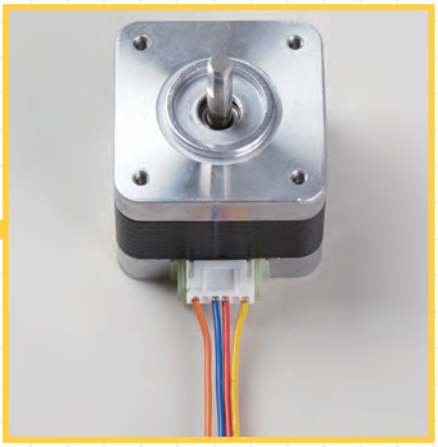
Prepare the housing, then plug the motor cable into the Z-axis motor

1



Turn the printer so the front is facing you.

2



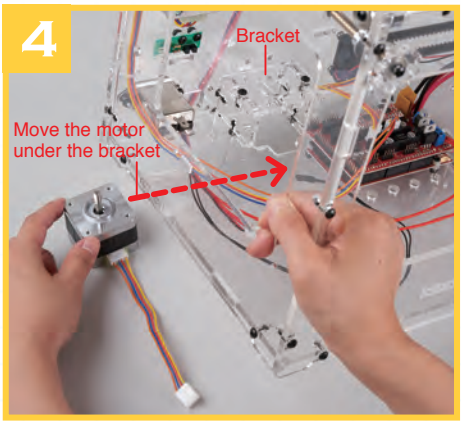
Get the Z-axis motor cable supplied and look for the end with the smaller connector. Hold this connector and plug it into the Z-axis motor, as shown above, so that when the motor spindle is uppermost and the plug is at the bottom, the orange wire is on the left and the yellow one on the right.

Temporarily attach the Z-axis motor to the housing

3

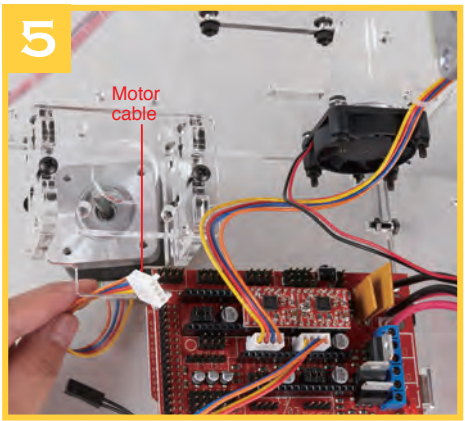
Put a spring washer, then a flat M3 washer, onto each of the four 10mm M3 screws. The spring washer should be next to the head of the screw.

4



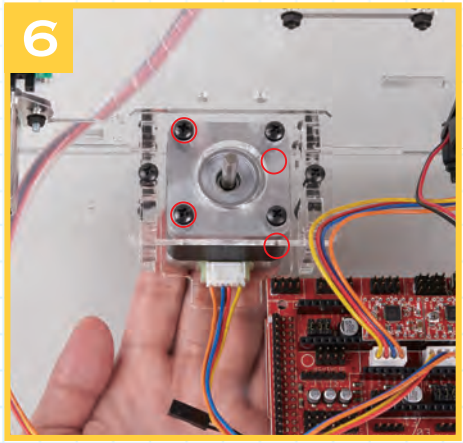
With the Z-axis motor cable at the front, lift up the left of the housing and position the motor under the Z-axis motor bracket.

5



Thread the motor cable through the gap in the base so it is inside the housing.

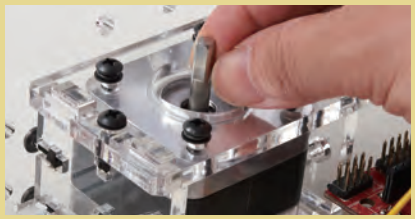
6



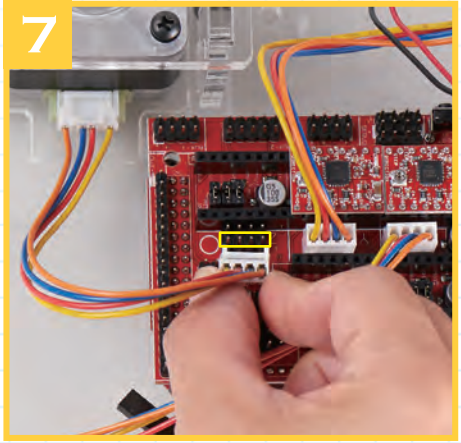
Lift the motor up to the bracket and insert the screws into their screw holes in the motor and do up the screws (ringed in red, above) with your fingers.

POINT

Do not over-tighten the screws holding the Z-axis motor to the bracket. Just make sure that it does not move about when you move the motor shaft up and down or from side to side.

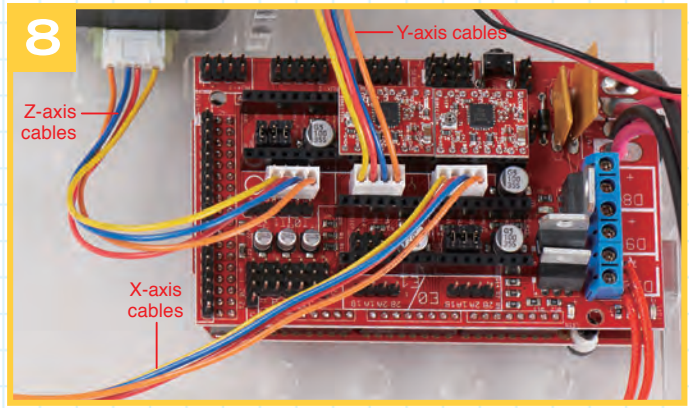


7



Untwist the cable if necessary. Plug the connector into the pins for the Z axis of the driver board, shown outlined in yellow, above. When viewed from the front, the yellow wire is on the left and the orange on the right.

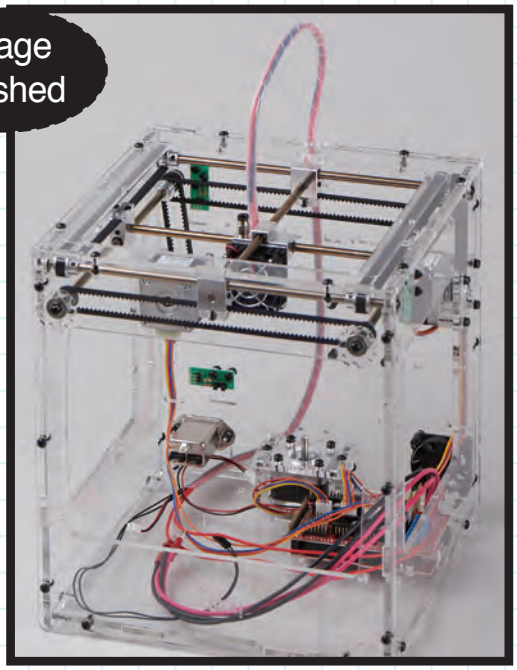
8



When you have plugged the Z-axis cables into the driver board, the area around the driver board should look like the photo above. Make sure you have the correct cables in the right locations and for all the motor cables, the yellow wires should be on the left when viewed from the front.

Stage finished

The Z-axis motor is loosely attached to its bracket. The cable from it is plugged into the driver board.



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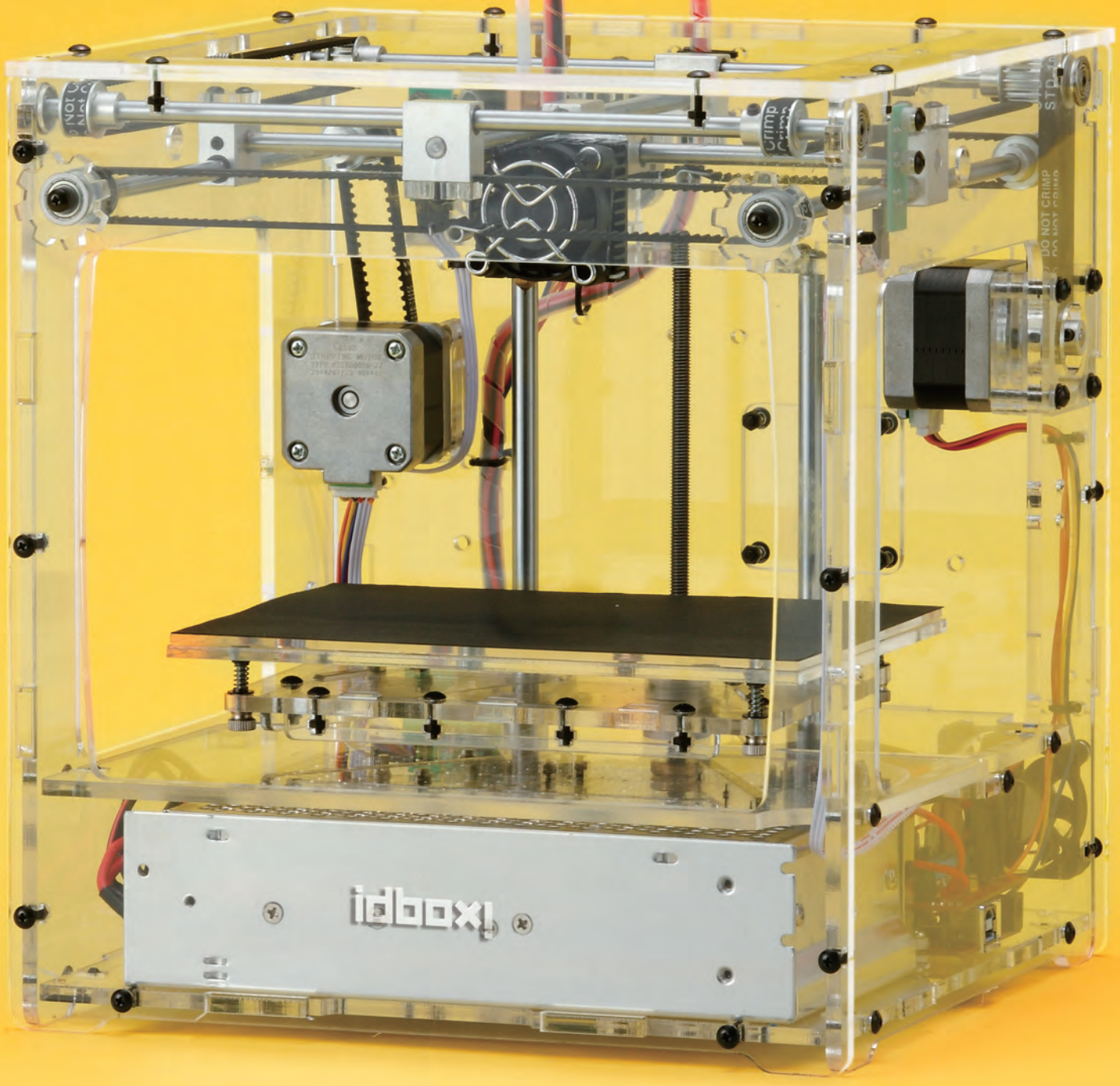

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